

WHAT IS CLAIMED IS:

1. A semiconductor integrated circuit device comprising an amplifying circuit for amplifying an analog color video signal outputted from an imaging element, an AD conversion circuit for converting the amplified signal to a digital signal, a differential means for obtaining a difference between the codes of the adjacent pixels in regard to the same color after the AD conversion and a code conversion means for code conversion of an output of said differential means.

2. A semiconductor integrated circuit device according to claim 1, wherein said code conversion means is a binary gray code conversion circuit for converting the input binary code to the gray code.

3. A semiconductor integrated circuit device according to claim 1, wherein said code conversion means is composed of a circuit for adding or subtracting a fixed value to or from the input code.

4. A semiconductor integrated circuit device according to any one of claims 1 to 3, wherein said differential means is composed of a delay circuit for delaying an output code of said AD conversion circuit and a subtraction means for obtaining a difference between the

code delayed by said delay circuit and the input code, while said delay circuit is constructed to vary a delay time depending on the color arrangement of the input video signal.

5. An imaging system comprising:

an imaging element provided with a color filter;

a semiconductor integrated circuit device including an amplifying circuit for amplifying an analog color video signal outputted from said imaging element, an AD conversion circuit for converting the amplified signal to a digital signal, a differential means for obtaining a difference between the codes of the adjacent pixels in regard to the same color after the AD conversion and a first code conversion means for converting an output of said differential means; and

a semiconductor integrated circuit device for image process including a second code conversion means for converting the codes outputted from said semiconductor integrated circuit device and an image processing circuit.

6. An imaging system according to claim 5, wherein said first code conversion means is a binary gray code conversion circuit for converting the binary code to the gray code and said second code conversion means is a gray binary code conversion circuit for converting the gray code into the binary code.

7. An imaging system according to claim 5, wherein said first code conversion means is composed of a circuit for adding or subtracting a fixed value to or from an input code and said second code conversion means is composed of a circuit for subtracting or adding a fixed value from or to an input code.

8. An imaging system according to any one of claims 5 to 7, wherein said differential means is composed of a delay circuit for delaying an output code of said AD conversion circuit and a subtraction means for obtaining a difference between the code delayed by said delay circuit and the input code, and said delay circuit is constructed to vary a delay time depending on color arrangement of an input video signal.

9. An imaging system according to any one of claims 5 to 8, wherein a storage means is provided to store a digital video data, said semiconductor integrated circuit device for image process is provided with a data compression circuit for compressing the code converted by said second code conversion means and a data expanding circuit for expanding the compressed data, and the data compressed by said data compression circuit is stored in said storage means.

10. A signal conversion method for converting an analog color video signal outputted from an imaging element to a digital signal, wherein a difference between the codes of the adjacent pixels in regard to the same color after the AD conversion of the video signal by the AD conversion circuit and an output code of said differential means is converted to the code of less number of bits to be changed over among the preceding and succeeding codes.

11. An imaging system comprising:

an imaging element provided with a color filter;

a first semiconductor integrated circuit device including:

an amplifying circuit for amplifying an analog color video signal outputted from said imaging element, an AD conversion circuit for converting the amplified analog color video signal to a digital signal, a differential circuit for obtaining a difference between codes of adjacent pixels of the digital signal in regard to a same color after a conversion operation of the AD conversion circuit and before outputting to outside of the first semiconductor integrated circuit device, and a first code conversion circuit for code conversion of an output of the differential circuit;

and a second semiconductor integrated circuit device including a second code conversion circuit for converting

an output from the first semiconductor integrated circuit device.

12. An imaging system according to claim 11,
wherein the first code conversion circuit is a binary to gray code conversion circuit for converting a binary code to a gray code;

and the second code conversion circuit is a gray to binary code conversion circuit for converting the gray code to the binary code.

13. An imaging system according to claim 11,
wherein said first code conversion circuit comprises a circuit for adding or subtracting a fixed value to or from an input code;

and said second code conversion circuit comprises a circuit for subtracting or adding a fixed value from or to an input code.

14. An imaging system according to claim 11,
wherein said differential circuit comprises a delay circuit for delaying an output code of said AD conversion circuit and a subtraction circuit for obtaining a difference between the output code delayed by the delay circuit and an input code,

and said delay circuit is constructed to vary a delay time depending on a color arrangement of an input video signal.

15. An imaging system according to claim 11,
wherein the imaging system includes a storage circuit to store digital video data,

the second semiconductor integrated circuit device is provided with a data compression circuit for compressing an output converted by said second code conversion circuit and a data expanding circuit for expanding the output compressed by the data compression circuit,

and codes compressed by the data compression circuit are stored in the storage circuit.

16. An imaging system according to claim 11,
wherein the second semiconductor integrated circuit has an image processor for processing codes converted by the second conversion circuit.

17. An imaging system comprising:
an imaging element provided with a color filter;
a first semiconductor integrated circuit device including a correlation double sampling circuit for sampling an analog color video signal output from the imaging element, an amplifying circuit for amplifying the analog color video signal output from the correlation

double sampling circuit, an AD conversion circuit for converting the analog color video signal amplified by the amplifying circuit to a digital signal, a differential circuit for obtaining a difference between codes of adjacent pixels of the digital data in regard to a same color, and a code conversion circuit for code conversion of an output of said differential circuit;

and a second semiconductor integrated circuit device having a code converter for converting an output from the first semiconductor integrated circuit device and an image processor for processing codes converted by the code converter.

18. An imaging system according to claim 17, wherein the code conversion circuit is a binary to gray code conversion circuit for converting a binary code to a gray code,

and the code converter is a gray to binary code conversion circuit for converting the gray code to the binary code.

19. An imaging system according to claim 17, wherein the code conversion circuit comprises a circuit for adding or subtracting a fixed value to or from an input code,

and the code converter comprises a circuit for subtracting or adding a fixed value from or to an input code.

20. An imaging system according to claim 17,
wherein said differential circuit comprises a delay circuit for delaying an output code of said AD conversion circuit and a subtraction circuit for obtaining a difference between the output code delayed by the delay circuit and an input code,
and said delay circuit is constructed to vary a delay time depending on a color arrangement of an input video signal.

21. An imaging system according to claim 17,
wherein the imaging system includes a storage circuit to store a digital video data,
the second semiconductor integrated circuit device is provided with a data compression circuit for compressing an output converted by the code converter, and a data expanding circuit for expanding the output compressed by the data compression circuit,
and codes compressed by said data compression circuit are stored in the storage circuit.

22. An imaging system according to claim 17,
wherein a sampling period of said correlation double
sampling circuit corresponds to a color arrangement of the
analog color video signal output from the image element.

23. An imaging system according to claim 22,
wherein said differential circuit comprises a circuit
to set sampling time of said correlation double sampling
circuit.

24. An imaging system according to claim 23,
wherein the circuit comprises a register for setting
the time.

25. An imaging system according to claim 23,
wherein the time corresponds to the color filter.

26. An imaging system comprising;
an imaging element provided with a color filter;
a first semiconductor integrated circuit device
including a correlation double sampling circuit for
sampling an analog color video signal output from the
imaging element, an AD conversion circuit for converting
the analog color video signal output from the correlation
double sampling circuit to a digital signal, a differential
circuit for obtaining a difference between codes of
adjacent pixels of the digital signal in regard to a same

color, and a code conversion circuit for code conversion of an output of said differential circuit;

and a second semiconductor integrated circuit device having a code converter for converting an output from the first semiconductor integrated circuit device.

27. An imaging system according to claim 26,
wherein a sampling period of said correlation double sampling circuit corresponds to a color arrangement of the analog color video signal output from the image element.

28. An imaging system according to claim 27,
wherein said differential circuit comprises a circuit to set sampling time of said correlation double sampling circuit.

29. An imaging system according to claim 28,
wherein the circuit comprises a register for setting the time.

30. An imaging system according to claim
27,
wherein the time corresponds to the color filter.